

# Honors Chemistry - Periodicity Problem Set

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1. Explain why it takes more energy to remove the second electron from a lithium atom than it does to remove the first electron from a lithium atom.
2. How does the ionic radius of a nonmetal compare with its atomic radius? Explain why the change in radius occurs.
3. Experiments show that the electronegativity of phosphorous is 2.5, and the electronegativity of chlorine is 3.5. Explain the difference in electronegativity using principles of atomic structure.
4. Explain how ionization energy changes as you move left to right across a period and explain this trend using principles of atomic structure.
5. Which is the most reactive group of metals and why?
6. Which is the most reactive group of nonmetals and why?
7. Explain why oxygen has a lower first-ionization energy than nitrogen.
8. Explain how you think the number of protons affects the radius size of the atom.
9.  $\text{Na}^+$  and  $\text{Mg}^{2+}$  ions each have ten electrons surrounding their nuclei. Which ion would you expect to have the larger ionic radius? Why?